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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,806	07/30/2003	Miwa Kozawa	030923	9494

38834 7590 11/29/2004

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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,806

Applicant(s)

KOZAWA ET AL.

Examiner

Sin J. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12 and 14-21 is/are rejected.
- 7) ☒ Claim(s) 11 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10-29-04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. In view of the amendment of September 2, 2004, previous 112 rejection of claim 16 is hereby withdrawn.
2. In view of showing under 37 CFR 1.132, previous 102(3) rejections of claims 1-11 and 14-21 over Nozaki et al (US 2003/0102285 A1) are hereby withdrawn.
3. In view of applicants' statement that the present application and U.S. Patent Application Publication No.2003/0102285 were, at the time the present invention was made, owned by Fujitsu Limited, previous 103(a) rejection of claim 12 is hereby withdrawn.
4. In view of the verified English translation of the priority document, JP 2002-240082, filed on August 21, 2002, previous 103(a) rejections of claims 1-9 and 14-21 over Kozawa et al (EP'043), which is published on May 28, 2003, are hereby withdrawn.
5. In view of the verified English translation of the priority document, JP 2002-240082, filed on August 21, 2002, previous 103(a) rejections of claims 1-9 and 14-21 over copending Application No. 10/305,258, which is filed on November 27, 2002, are hereby withdrawn.
6. In view of the terminal disclaimer, previous double patenting rejections of claims 1-9 and 14-21 over copending Application No. 10/305,258 are hereby withdrawn.
7. Due to new grounds of rejections, the following rejections are made non-final.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 1-10, 12, and 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibashi et al (US 6,579,657 B1) in view of Vasta (4,572,870).

In col.2, lines 38-57, Ishibashi teaches a method for manufacturing a semiconductor device: A first resist pattern is formed from a first resist (a mixture of *novolac resin* and a naphthoquinonediazide photosensitive agent) on a semiconductor base layer. A second resist is formed on the first resist pattern which generates crosslinking reaction in the presence of an acid. A crosslinked film is formed at a portion of the second resist contacting with the first resist pattern by the agency of an acid fed from the first resist pattern. Non-crosslinked portions of the second resist are removed (i.e., developed) to form a second resist pattern. Finally, the semiconductor base layer is subjected to etching through the second resist pattern used as a mask. Ishibashi teaches (see col.2, lines 31-38, lines 62-65) as the second resist material, a fine pattern-forming material, which is a *mixture of water soluble* resin such as polyvinyl alcohol or polyvinyl acetal and a crosslinking agent such as a melamine derivative or a urea derivative.

Ishibashi's second resist does not contain a nitrogen-containing compound. Vasta teaches a coating composition comprising a resin, a curing agent, and a bicyclic amidine (a nitrogen containing compound) (col.1, lines 41-62). Vasta states (col.1, lines 35-40) that such coating composition is stable against weather, corrosion and abrasion and specifically states (col.4, lines 32-36) that the bicyclic amidine significantly extends the pot life of the composition. Based on this teaching, it would have been obvious to one of ordinary skill in the art to include a nitrogen containing compound such as

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Vasta's bicyclic amidine in Ishibashi's second resist composition in order to stabilize the second resist composition and to increase the pot life of the second resist composition. Therefore, Ishibashi in view of Vasta would render obvious present inventions of claims 1, 2, 4, 8, 9, 16-21.

With respect to present claim 3, Vasta teaches that the bicyclic amidine can be replaced with a strong organic base such as tertiary alkyl ammonium hydroxide. Since the prior art teaches the equivalence of bicyclic amidine and tertiary alkyl ammonium hydroxide, it would have been obvious to one of ordinary skill in the art to use a tertiary alkyl ammonium hydroxide in Ishibashi's second resist composition in order to stabilize the second resist composition and to increase the pot life of the second resist composition. Therefore, Ishibashi in view of Vasta would render obvious present invention of claim 3.

Ishibashi teaches (col.9, lines 6-12) that in order to improve the film-forming properties, surface active agents such as non-ionic polyoxyethylene nonylphenyl ether type surfactant can be added to the second resist material. Therefore, Ishibashi in view of Vasta would render obvious present inventions of claims 5-7.

With respect to present claims 10 and 12, Ishibashi teaches (col.7, lines 34-50) that as his *water-soluble* resin for the second resist, polyacrylic acid, polyvinyl acetal, polyvinylpyrrolidone, polyvinyl alcohol, polyethyleneimine, polyethylene oxide, styrene-maleic acid copolymer, polyvinylamine resin, polyallylamine, oxazoline group-containing resists, water-soluble melamine resins, water-soluble urea resins, alkyd resins, and sulfone amide resins can be used and that the water-soluble resins may be used singly

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or in combination of two or more. Therefore, it would have been obvious to one of ordinary skill in the art to use the combination of polyvinyl acetal (or polyvinyl alcohol) and styrene-maleic acid copolymer as Ishibashi's water soluble resin for the second resist with a reasonable expectation of obtaining a material for finely isolated resist patterns capable of reducing an isolation size or hole size in the pattern when the resist pattern is formed in a semiconductor manufacturing process. Since the styrene-maleic acid copolymer is water soluble aromatic compound as well as a resin containing an aromatic compound in a portion thereof, Ishibashi in view of Vasta would render obvious present inventions of claims 10 and 12.

Ishibashi teaches (col.9, lines 14-22) that the solvents for the second resist may be water and alcoholic solvents. Therefore, Ishibashi in view of Vasta would render obvious present invention of claim 14 and 15.

Allowable Subject Matter

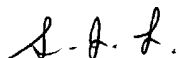
10. Claims 11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Ishibashi does not teach or suggest those specific compounds of present claims 11 and 13.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

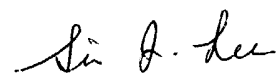
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee
November 28, 2004



Sin J. Lee
Patent Examiner
Technology Center 1700